IN THE CLAIMS

The following is a complete listing of the claims, which replaces all previous versions and listings of the claims.

1. (currently amended) A system for estimating parameters of a motor, the system comprising:

an electronic device comprising:

a first module that is operable to receive electrical input data obtained at first and second load points of an electric motor; and

a second module that is operable to calculate [[an]] a first estimated value of a first estimated variable of [[an]] the electric motor based on the electrical input data obtained at the first and second load points of the electric motor, and to calculate [[an]] a second estimated value of a second estimated variable of the motor based on the first estimated variable, wherein the electronic device is operable to calculate the first and second estimated values during operation of the motor without disconnecting the motor from a load.

2. (previously presented) The system as recited in claim 1, wherein the second estimated variable is an operating parameter of the electric motor.

3. (original) The system as recited in claim 2, wherein the operating parameter is motor torque.

4. (original) The system as recited in claim 2, wherein the operating parameter is motor efficiency.

5. (previously presented) The system as recited in claim 2, wherein the operating parameter is rotor temperature.

6. (previously presented) The system as recited in claim 1, wherein the first estimated variable of the electric motor comprises electrical resistance of the rotor during operation of the electric motor.

7. (previously presented) The system as recited in claim 1, wherein the first estimated variable of the electric motor comprises stator inductance.

8. (original) The system as recited in claim 1, wherein the electrical input data comprises input voltage, input current, and input frequency.

9. (original) The system as recited in claim 8, wherein the electrical input data comprises motor temperature and motor speed.

10. (original) The system as recited in claim 8, wherein the electrical input data comprises input power.

11. (previously presented) The system as recited in claim 8, wherein the electronic device is operable to calculate input power from the input current and the input voltage.

12. (previously presented) The system as recited in claim 1, comprising a visual display operable to provide a visual indication of the estimated value of the first estimated variable, the estimated value of the second estimated variable, or both.

13. (original) The system as recited in claim 1, comprising a communication module operable to enable data to be manually provided to the system.

14. (original) The system as recited in claim 1, wherein the electronic device is coupleable to an external communications network.

15. (currently amended) An electric motor system for estimating a parameter of a motor, the system comprising:

an electronic device comprising:

a first module that is operable to receive electrical input data obtained at first, second, and third load points of an electric motor; and

a second module that is operable to calculate [[an]] a first estimated value of a first estimated variable of [[an]] the electric motor based on the electrical input data obtained at the first, second, and third load points of the electric motor, and to calculate [[an]] a second estimated value of a second estimated variable of the motor based on the first estimated variable, the second estimated variable including an operating parameter, wherein the electronic device is operable to calculate the first and second estimated values during operation of the motor without removing the motor from service.

16. (original) The system as recited in claim 15, wherein the electronic device comprises a data processing module adapted to estimate the operating parameter without a measurement of stator resistance of the electric motor.

17. (original) The system as recited in claim 15, wherein the operating parameter comprises motor efficiency.

18. (original) The system as recited in claim 15, wherein the operating parameter comprises motor torque.

19. (original) The system as recited in claim 15, wherein the operating parameter comprises motor output power.

20. (original) The system as recited in claim 15, wherein the operating parameter comprises rotor temperature.

21. (original) The system as recited in claim 15, wherein the electrical input data comprises input voltage, input current, and speed of the electric motor.

22. (original) The system as recited in claim 21, wherein the electrical input data comprises motor temperature and frequency of the electric motor.

23. (original) The system as recited in claim 22, wherein the electrical input data comprises input power of the electric motor.

24. (previously presented) The system as recited in claim 22, wherein the electronic device is operable to calculate input power of the electric motor.

25. (currently amended) A system for estimating parameters of a motor, the system comprising:

an electronic device comprising:

a first module that is operable to receive baseline motor parameters of an inverter-driven electric motor and to receive electrical input data obtained at a desired operating condition of the inverter-driven electric motor; and

a second module that is operable to calculate [[an]] a first estimated value of a first estimated variable of [[an]] the inverter-driven electric motor based on the baseline motor parameters and based on the electrical input data obtained at [[a]] the desired operating condition of the inverter-driven electric motor, and to calculate [[an]] a second estimated value of a second estimated variable of the motor based on the first estimated variable, wherein the baseline motor parameters comprise a first motor frequency and the desired operating condition comprises a second motor frequency, and wherein the electronic device is operable to calculate the first and second estimated values during operation of the motor without disconnecting the motor from a load.

26. (previously presented) The system as recited in claim 25, wherein the electronic device is operable to calculate an estimated value of at least one operating parameter of the inverter-driven electric motor based on the estimated value of the first estimated variable.

27. (previously presented) The system as recited in claim 25, wherein the baseline motor parameters define an equivalent circuit of the inverter-driven electric motor.

28. (original) The system as recited in claim 25, wherein the first motor frequency is approximately 60 Hertz.

29. (previously presented) The system as recited in claim 25, wherein the electronic device comprises a motor estimation module adapted to calculate a core loss resistance at the desired operating condition based at least partially on a change in motor frequency.

30. (original) The system as recited in claim 25, wherein the electrical input data comprises input voltage, input current, input frequency, and temperature.

31. (original) The system as recited in claim 25, comprising a visual display and a keyboard.

32. (currently amended) A system for estimating parameters of a motor, the system comprising:

means for obtaining an estimated value of a first estimated variable of an electric motor based on electrical input data of the electric motor, the first estimated variable comprising an electrical parameter of the electric motor; and

means for estimating a value of a second estimated variable of the electric motor based at least partially on the means for obtaining ~~electrical parameters~~ the estimated value

of the first estimated variable, the second estimated variable comprising at least one operating parameter of the electric motor.

33. (previously presented) The system as recited in claim 32, wherein the means for obtaining the estimated value of the first estimated variable comprises means for estimating at least one electrical parameter based at least partially on motor parameters measured at a single load point of the electric motor.

34. (previously presented) The system as recited in claim 32, wherein the means for obtaining the estimated value of the first estimated variable comprises means for estimating at least one electrical parameter based at least partially on motor parameters measured at three load points of the electric motor.

35. (previously presented) The system as recited in claim 32, wherein the means for obtaining the estimated value of the first estimated variable comprises means for estimating at least one electrical parameter based at least partially on baseline motor parameters and motor parameters measured at a desired operating load point of the electric motor.

36. (previously presented) The system as recited in claim 32, wherein the means for estimating the value of the second estimated variable comprises means for estimating operating efficiency of the electric motor.

37. (previously presented) The system as recited in claim 32, wherein the means for estimating the value of the second estimated variable comprises means for estimating output power of the electric motor.

38. (previously presented) The system as recited in claim 32, wherein the means for estimating the value of the second estimated variable comprises means for estimating torque of the electric motor.

39. (previously presented) The system as recited in claim 32, wherein the means for estimating the value of the second estimated variable comprises means for estimating rotor temperature of the electric motor.

40. (previously presented) The system as recited in claim 32, wherein the means for estimating the value of the second estimated variable comprises means for estimating performance of the electric motor.

41. (currently amended) A machine readable medium having application instructions for analyzing an electric motor stored thereon, comprising:

a first module ~~instructions~~ adapted to calculate an estimated value of a first estimated variable of the electric motor during operation of the motor based at least partially on measured motor parameters, the first estimated variable comprising an electrical ~~parameter,~~ parameter; and

a second module adapted to estimate a value of a second estimated variable of the electric motor based at least partially on the first estimated variable, without interfering with

the operation of the motor, wherein the second estimated variable comprises an operating parameter of the electric motor.

42. (currently amended) The machine readable medium as recited in claim 41, comprising ~~instructions~~ at least one module adapted to estimate a plurality of electrical parameters based on motor measurements at a single load of the electric motor.

43. (currently amended) The machine readable medium as recited in claim 41, comprising ~~instructions~~ at least one module adapted to estimate a plurality of electrical parameters based on motor measurements at first, second, and third loads of the electric motor.

44. (currently amended) The machine readable medium as recited in claim 41, comprising ~~instructions~~ at least one module adapted to estimate a plurality of electrical parameters based on baseline motor parameters and motor measurements at a desired operating load of the electric motor, wherein the baseline motor parameters comprise a first motor frequency and the desired operating load comprises a second motor frequency different from the first motor frequency.

45. (canceled)

46. (previously presented) The machine readable medium as recited in claim 41, wherein the operating parameter comprises efficiency of the electric motor.

47. (previously presented) The machine readable medium as recited in claim 41, wherein the operating parameter comprises torque of the electric motor.

48. (previously presented) The machine readable medium as recited in claim 41, wherein the operating parameter comprises power output of the electric motor.

49. (previously presented) The machine readable medium as recited in claim 41, wherein the operating parameter comprises rotor temperature of the electric motor.

50. (currently amended) A motor analysis device, comprising:

a first ~~data processing~~ module comprising a plurality of motor estimation modules adapted to estimate a first value of a first estimated variable of an electric motor based on input parameters, which are at least partially different for each of the plurality of motor estimation ~~modules,~~ modules; and

a second module adapted to estimate a second value of a second estimated variable of the motor based on the first estimated ~~variable,~~ variable;

wherein the ~~data processing~~ first module is operable to calculate the first and second estimated values during operation of the motor without disconnecting the motor from a load.

51. (previously presented) The motor analysis device as recited in claim 50, wherein the plurality of motor estimation modules comprises a single load point motor estimation module adapted to estimate a plurality of electrical parameters of the electric motor based on motor measurements at a single load point of the electric motor, the plurality of electrical parameters including the first estimated variable.

52. (previously presented) The motor analysis device as recited in claim 50, wherein the plurality of motor estimation modules comprises a three load point motor estimation module adapted to estimate a plurality of electrical parameters of the electric motor based on motor measurements at first, second, and third load points of the electric motor, the plurality of electrical parameters including the first estimated variable.

53. (previously presented) The motor analysis device as recited in claim 50, wherein the plurality of motor estimation modules comprises a baseline and load point motor estimation module adapted to estimate a plurality of electrical parameters of the electric motor based on baseline motor parameters and motor measurements at a desired operating load of the electric motor, wherein the baseline motor parameters comprise a first motor frequency and the desired operating load comprises a second motor frequency different from the first motor frequency, the plurality of electrical parameters including the first estimated variable.

54. (previously presented) The motor analysis device as recited in claim 50, wherein the second estimated variable is an operational performance parameter of the electric motor.

55. (previously presented) A method of analyzing a motor having a rotor and a stator, comprising:

providing an instrumentation system with stator resistance data for the motor;

providing the instrumentation system with output speed and electrical input data obtained during operation of the motor at first and second load points of the motor;

operating the instrumentation system during operation of the motor and without disconnecting the motor from a load to calculate an estimated value of a first estimated variable of the motor based on the stator resistance data and the electrical input data; and

operating the instrumentation system to calculate an estimated value of a second estimated variable of the motor based on the first estimated variable.

56. (previously presented) The method as recited in claim 55, wherein providing the instrumentation system with output speed and electrical input data comprises obtaining input current, input voltage, frequency, and stator temperature of the motor at the first and second load points.

57. (original) The method as recited in claim 55, further comprising operating the instrumentation system to estimate at least one motor operating performance parameter based on the estimated values and the electrical input data.

58. (previously presented) A method of operating a motor having a rotor and a stator, comprising:

providing an instrumentation system with motor speed and electrical input data obtained during operation of the motor with first, second, and third loads on the motor;

operating the instrumentation system during operation of the motor and without removing the motor from service to calculate an estimated value of a first estimated variable of the motor based on the motor speed and electrical input data obtained during operation of the motor with the first, second, and third load points on the motor; and

operating the instrumentation system to calculate an estimated value of a second estimated variable of the motor based on the first estimated variable.

59. (previously presented) The method as recited in claim 58, wherein providing the instrumentation system with motor speed and electrical input data comprises obtaining input current, input voltage, and frequency of the motor at the first, second, and third load points.

60. (original) The method as recited in claim 58, further comprising operating the instrumentation system to estimate at least one motor performance parameter based on the estimated values, the motor speed, and the electrical input data.

61. (previously presented) A method of operating an inverter-driven motor, comprising:

providing an instrumentation system with baseline parameters of the inverter-driven motor at a first frequency;

providing the instrumentation system with electrical input data obtained for the inverter-driven motor operating at a second frequency;

operating the instrumentation system during operation of the motor and without disconnecting the motor from a load to calculate a first estimated operational parameter of the inverter-driven motor based on the baseline parameters and the electrical input data; and

operating the instrumentation system to calculate a second estimated operational parameter of the inverter-driven motor based on the first estimated operational parameter.

62. (original) The method as recited in claim 61, wherein providing the instrumentation system with electrical input data comprises obtaining input current, input voltage, frequency, and temperature of the motor at the desired operating load.

63. (previously presented) The method as recited in claim 61, wherein operating the instrumentation system to calculate the first estimated operational parameter comprises estimating output speed of the motor.

64. (previously presented) The method as recited in claim 61, wherein operating the instrumentation system to calculate the first estimated operational parameter comprises estimating torque of the motor.

65. (previously presented) The method as recited in claim 61, wherein operating the instrumentation system to calculate the first estimated operational parameter comprises estimating output power of the motor.

66. (previously presented) The method as recited in claim 61, wherein operating the instrumentation system to calculate the second estimated operational parameter comprises estimating efficiency of the motor.

67. (previously presented) The method as recited in claim 61, wherein operating the instrumentation system to calculate the first estimated operational parameter comprises calculating a core loss resistance at the second frequency as a function of the second frequency and a baseline core loss resistance at the first frequency.